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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,365	04/16/2004	Chang Yeon Kim	8733.1032.00-US	8096

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EXAMINER	
MA, CALVIN	

ART UNIT	PAPER NUMBER
2629	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/825,365	KIM ET AL.	
	Examiner	Art Unit	
	CALVIN C. MA	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 August 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5-7,13 and 15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-7,13 and 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application.
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 13 and 15 rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (US Patent 6,369,786) in view of Morita (US Pub: 2003/0151577), Kimura (US Pub: 2002/0105279), Koyama (US Pub: 2002/0011796), and LeChavalier (US Patent: 7, 126,568).

As to claim 1, Suzuki teaches an electro-luminescence display (i.e. organic EL display) (see Fig. 4, Col. 4, Lines 27-33) device, comprising:

gate lines (L1, L2 ... Ly);

data lines crossing the gate lines (i.e. the data lines S1, S2, ...Sx crosses the gate line L to form the matrix) (see Fig. 4, Col. 4, Lines 5- 20);

pixel cells (i.e. current driven display element) at crossing of the gate lines and the data lines (see Fig. 4, Col. 4, Lines 27-29);

a gate driver (1) that sequentially applies a gate signal to the gate lines during one horizontal period (i.e. the gate driver 1 applies the switching to the pixel with the action of scanning drive) (see Fig. 4, Col. 3, Lines 52-65); and

a plurality of data driving circuits (i.e. each of the current and voltage supply CS and C components in 2 and 3) that apply voltage signals to the pixel cells along a data line during a first time (T1) of within the horizontal period and apply current signals to the pixel cells along the data line during a second time (T2) within the horizontal period after the first time of the horizontal period (i.e. the first time is for Precharging voltages T1 and the second period is for current driving period T2 and both of the application are along the data lines) (see Fig. 5-6, Col. 5, Lines 27-40),

wherein each of the plurality of data driving circuit includes a voltage driver (5) that applies voltage signals to the data lines to pre-charge the voltage signals onto storage capacitors in the pixel cells, and a current driver (CS1) that allows the current signals corresponding to voltage signal to flow into the pixel cells (see Fig. 5-6, Col. 5, Lines 1-40).

However, Suzuki does not explicitly teach a gamma driver that generates a plurality of gamma voltage signals corresponding to image data and a plurality of gamma current signals corresponding to the image data; and applying the gamma voltage signal to flow into the pixel cells. Morita teaches a gamma voltage driver (i.e. the ladder circuitry that provide for gamma correct of the data line) (see [0207], [0404]) that generates a plurality of gamma voltage signals corresponding to image data; and applying the gamma voltage signal to flow into the pixel cells (i.e. the plurality of gradation related voltages in applied to the driver based on gamma characteristics correction) (see Fig. 1, [0199-0207]).

Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to have adopted the plurality of gamma voltages generation data driving circuits of Morita in the OLED driving system of Suzuki in order to create a superior display quality base on Gamma correct output being displayed (see Morita, Col. 2, Lines 43-58).

Morita and Suzuki does not teach gamma current signals corresponding to the image data, Kimura teaches the gamma current signals corresponding to image data (i.e. the 108 correction circuitry able to output correct current signal based on gamma information) (see Kimura, Figure 8, [0216-0217]).

Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to have both the gamma voltage signal design of Morita and Suzuki with the gamma current signal of Kimura in the OLED driving system in order to improve color performance of the OLED display system (see Kimura [0010]).

Morita, Suzuki, and Kimura does not teach the data driving circuit applying signals in response to a first level of a control signal and a second level of the control signal. Koyama teaches the switching of a dual control signals with a first level (i.e. the switching signal Lo) and a second level (i.e. switching signal Hi) for the data driving circuit supplying signal to an OLED system (i.e. the drawing of figure 3A and 3B shown the switching circuit of figure 1 in action which the switching signal changes the signal that is applied to the circuit at different time of circuit operation) (see Koyama, Fig. 1, 3A, 3B, [0048], [0106-0112]).

Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to have used the dual signaling switching design of Koyama in the system of Morita in order to increase the aperture ratio of the display panel and increase display performance (see Koyama [0024-0026]).

Morita, Suzuki, Kimura, and Koyama does not explicitly teach a first level of control signal during a first time and a second level of control signal during the second time, LeChevalier teaches a OLED controlling signal where a first level of control signal during a first time and a second level of control signal during the second time is applied to switch the precharge supply (i.e. the drawings of figure 2A and 2B shows the operation of the dual mode of row driver control 250 where during the precharge mode the control signal sets the switch to one level and during the normal operation the control signal set the switch to a second level to applier voltage and current to the pixel circuit 280 where the current source is alternated with ground signal and the voltage source is alternated with ground signal) (see Fig. 2A, 2B, Col. 7, Line 20-Col.8, Line 23).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to have used the different timing of signaling control method of LeChevalier in the overall OLED system of Suzuki, in order to allow for precharge control of the circuitry to compensate for to compensate for delay in OLED illumination with precharging functions) (see LeChavalier Col. 3, Lines 45-54).

As to claim 13, Suzuki teaches a method of driving an electro-luminescence display device, comprising:

applying a gate signal from a gate driver during each horizontal period to select pixel cells along specific horizontal period to pre-charge the voltage value onto a storage capacitor of the pixel cells (i.e. during the first time T1 the Precharging voltages 5 is applied and the second period is for current driving period T1 to T2) (see Fig. 5-6, Col. 5, Lines 1-40); and

applying a current value corresponding to the image data to the data lines during a second time within the horizontal period after the first time (i.e. the current drive is applied after the precharge period) (see Fig. 5-6, Col. 5, Lines 1-40).

However, Suzuki does not explicitly teach plurality of gamma voltages signal and gamma current signal. Morita teaches plurality of gamma voltages (i.e. the plurality of gradation related voltages in applied to the driver based on gamma characteristics) (see Fig. 11, Col. 5, Lines 1-50). Kimura teaches current signal based on gamma information (see Fig. 8, [0217]). Morita, Suzuki, and Kimura does not teach the data driving circuit applying signals in response to a first level of a control signal and a second level of the control signal, Koyama teaches the switching of a dual control signals with a first level (i.e. the switching signal Lo) and a second level (i.e. switching signal Hi) for the data driving circuit supplying signal to an OLED system (i.e. the drawing of figure 3A and 3B shown the switching circuit of figure 1 in action which the switching signal changes the signal that is applied to the circuit at different time of circuit operation) (see Koyama, Fig. 1, 3A, 3B, [0048], [0106-0112]).

Therefore, the combination of Suzuki, Kimura, Morita and Koyama teaches the said limitations.

As to claim 2, Suzuki teaches the electro-luminescence display device according to claim 1, wherein the first time is shorter than the second time (i.e. the timing diagram in Fig. 6 clearly shows that precharge period T1 is shorter then the voltage applying period) (see Fig. 6, Col. 5, Lines 1-40).

As to claim 15, Suzuki teaches the method according to claim 13, wherein the first time is less than the second time (i.e. the timing diagram in Fig. 6 clearly shows that precharge period T1 is shorter then the voltage applying period) (see Fig. 6, Col. 5, Lines 1-40).

3. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki in view of Morita, Kimura, Koyama LeChavalier as applied in claim 1 above, further in view of Ishizuka et al. (US Patent: 6,756,951)

As to claim 5, Suzuki and Morita teach the electro-luminescence display device according to claim 1, wherein the voltage driver includes:

a plurality of voltage driving circuit (i.e. Voltage source 5) corresponding to each data line that generate a voltage signal corresponding to the image data (i.e. the Precharging voltage is according to the data that is to be applied) (see Suzuki Fig. 4, 6, Col. 4, Line 40- Col. 5, Line 40); and

a plurality of first switches (i.e. switches C1… Cy) between each of the voltage driving and each of the data lines, wherein the first switches are turned on by the first level (i.e. the Lo level signaling of Koyama) of the control signal (i.e. by definition the switch are controlled by a signal that control the input of the Precharging voltage) (see Suzuki Fig. 4, 6, Col. 4, Line 40- Col. 5, Line 40).

However, Suzuki does not explicitly teach a block for each of the individual data voltage driving circuit. Ishizuka teaches voltage driving control block (201, 202, and 203) (see Fig. 8, Col. 8, Lines 8-12).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to have using the modular control design of Suzuki in the overall display design of Suzuki, since more data driving circuit make the display panel uniform (See Ishizuka Col.3, Lines 1-4).

As to claim 6, Suzuki and Morita teach the electro-luminescence display device according to claim 5, wherein said current driver includes:

a plurality of current driving circuit (CS1…CSx) corresponding to each data lines applying the current signal corresponding to the plurality of gamma voltage signals (see Morita, Fig. 11), said current driving circuit having 1 subgroups; and a plurality of second switches (S1…Sx) between each of the current driving circuit and each of the data lines and wherein the second switches are turned on by the second level of the (i.e. the Lo level signaling of Koyama) control signal (i.e. since the current driving circuit feed each data line according to the control signal controlling S based on the image

data they form display components dedicated for each line) (see Suzuki, Fig. 4, 6, Col. 4, Line 40- Col. 5, Line 40).

As to claim 7, Suzuki teaches the electro-luminescence display device according to claim 6, wherein the control signal remains at a first level during the first time (T1) and remaining at second level during the second time (T2) (see Fig. 6, Col. 5, Lines 1-40).

Response to Arguments

4. Applicant's arguments with respect to claims 1, 2, 5-7 and 13, 15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CALVIN C. MA whose telephone number is (571)270-1713. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quan-Zhen Wang can be reached on 571-272-3114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Calvin Ma
November 4, 2010

/Quan-Zhen Wang/
Supervisory Patent Examiner, Art Unit 2629